ASSOCIATION POUR L'ÉTUDE DE LA PALÉONTOLOGIE
ET DE LA STRATIGRAPHIE HOUILLÈRES

PUBLICATION N° 18

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BY

RUDOLF FLORIN
Fil. Dr., Professor at The Royal Swedish Academy of Science.
Stockholm.

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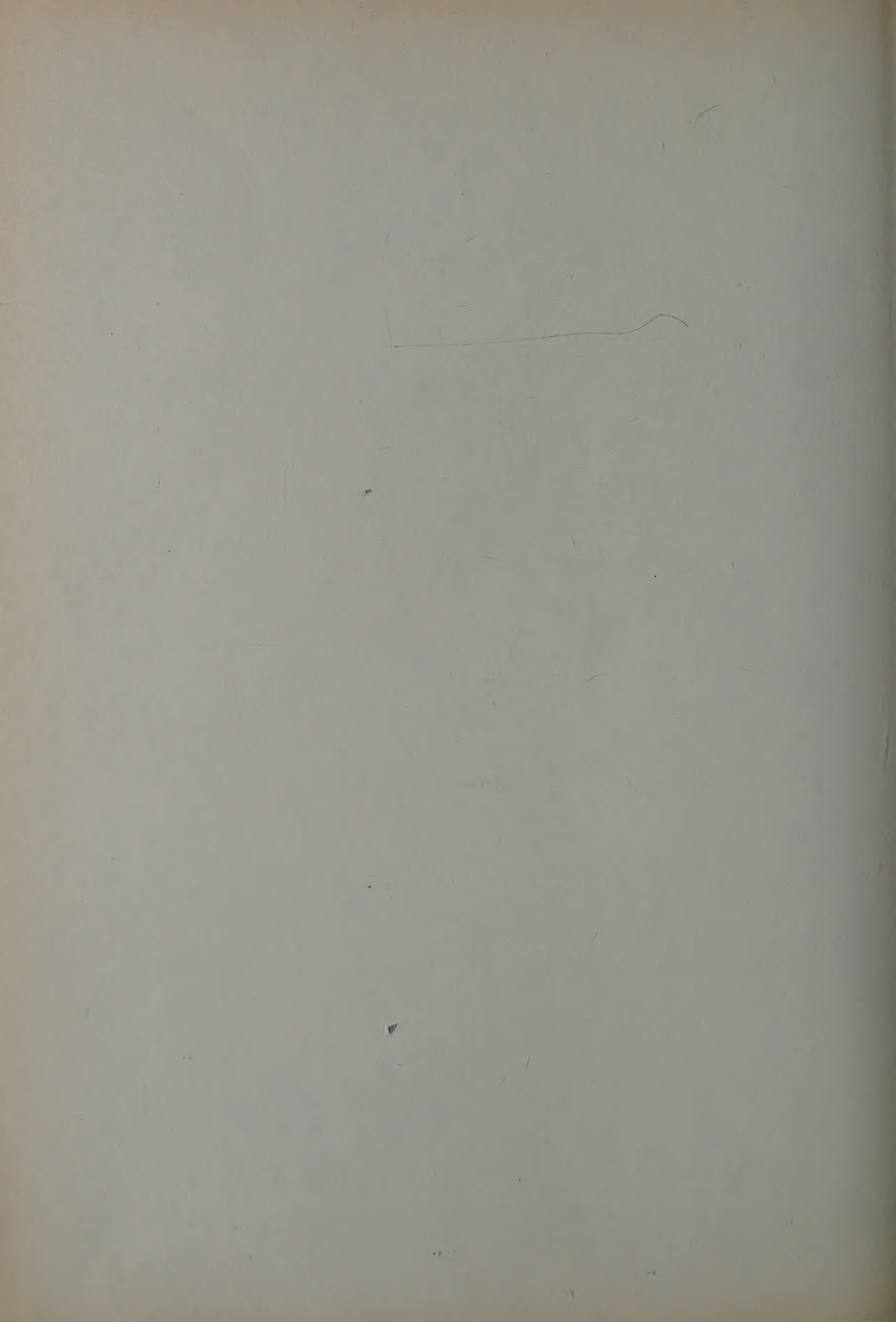
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NOTE ON *ULLMANNIA* FROM THE UPPER PERMIAN FORMATION OF NORTH-EASTERN BELGIUM.

According to GOTHAN & NAGALHARD (1922, p. 442), plantbearing strata of Upper Permian age (Zechstein) have in recent years repeatedly been found in borings from the Ruhr region, the Rhineland, and the Netherlands. A characteristic element of the flora of these strata is *Ullmannia*, an interesting conifer genus, our knowledge of which has mainly been based on studies of specimens collected at Gera in Saxony, at Ilmenau in Thuringia, at Frankenberg in Hesse, and at Wehofen near Dinslaken in Rhineland.

Until quite recently there has been no record at all of *Ullmannia* from Belgium. At the end of last year Dr. F. STOCKMANS of the Royal Institute of Natural History of Belgium, Brussels, informed me, however, of a find of a sterile leafy shoot of this kind in connection with a boring made in the Campine coalfield at Meeuwen, village situated some 20 km west of Maeseyck, in the north-eastern part of the country ([1]). The specimen came from a depth of 915.40 m (boring 121, see map, plate I). It belongs to the Upper Permian (Zechstein).

Dr. STOCKMANS paid me the compliment of inviting me to examine and identify this valuable specimen. After careful mechanical preparation for the purpose of exposing as much of the shoot as possible, the specimen was photographed in natural size (Fig. 1, Plate II) as well as magnified 2.9 and 7 times (Figs. 2 and 3) in order to demonstrate its external features. Fragments of leaves were moreover first treated with Schulze's maceration fluid and then with ammonia, subsequently stained with safranin, and finally mounted in glycerin-gelatine, for the examination and microphotographing of their epidermal (cuticular) structure (Figs. 4-9).

([1]) Permission to publish the present note was kindly granted by Dr. A. GROSJEAN, Chief of the Geological Survey of Belgium. The leafy shoot was discovered in Permian formations (dolomitic marls) from a core of the Meeuwen boring by geologists of the Survey who handed it over to Dr. F. STOCKMANS for determination. Permission for transferring the specimen to the collections of the Institute of Natural History was also given by Dr. A. GROSJEAN, to whom grateful thanks are due. Dr. M. GULINCK, of the Geological Survey, wrote a description of the post-Carboniferous strata encountered by the boring [2].

DESCRIPTION OF THE SPECIMEN.

Leafy shoot of ultimate order (Figs. 1-3) c. 4 cm long and c. 1.5 cm in diameter, slightly curvate. Leaves rather thick, coriaceous, closely arranged spirally, imbricate, ovate-lanceolate to linear-lanceolate, slightly S-shaped in flank view, patulous (their middle regions at an angle of c. 35° with the shoot axis) on all sides of the shoot, sessile and decurrent on the axis, somewhat obtuse at their apices, convex at their backs, densely striated longitudinally (Fig. 3), amphistomatic (Figs. 5 and 6), subdenticulate at their margins (Fig. 4), 9 to 12 mm long, 2.5 to 4 mm broad, and c. 1 mm thick.

Epidermal structure of these leaves practically the same on their upper and under sides (Figs. 5 and 6). There are on both a relatively large number of long, mostly regularly parallel and closely arranged longitudinal rows of stomatal apparatuses as a rule orientated longitudinally, and two very narrow, non-stomatic marginal zones. Although the space between two adjacent stomatal apparatuses in the same row varies, these seem never to have any subsidiary cell in common. Epidermal cells outside the stomatal apparatuses arranged more of less regularly in longitudinal rows, approximately isodiametric in the stomatal rows but usually more or less elongate between these, and a little less strongly cutinized on the under than on the upper side of the leaf.

Stomatal apparatuses (Figs. 8 and 9) haplocheilic and monocyclic. Subsidiary cells approximately isodiametric, usually 6 to 8 to each apparatus, two polar and the others lateral; each subsidiary cell provided with a fairly strong cuticular papilla arching over the circular or oblong, c. 10 μ deep outer air-chamber, at the bottom of which the two guard-cells are situated. Epidermal cells outside the stomatal apparatuses also as a rule provided with a cuticular papilla placed in their centre; these papillae are more strongly developed in than between the stomatal rows (Fig. 7).

COMPARISONS.

Both in external features and in the structure of the leaf epidermis the Belgian specimen described above agrees well with the material of *Ullmannia Bronnii* examined by me from the German localities Gera in Saxony, Frankenberg in Hesse, and Wehofen near Dinslaken in Rhineland. It therefore undoubtedly belongs to this species. *U. Bronnii* resembles closely *U. frumentaria* (Schloth.) Goepp., but differs in its leaves being shorter and somewhat obtuse, and in certain details of the structure of its leaf epidermis.

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LIST OF PLATES.

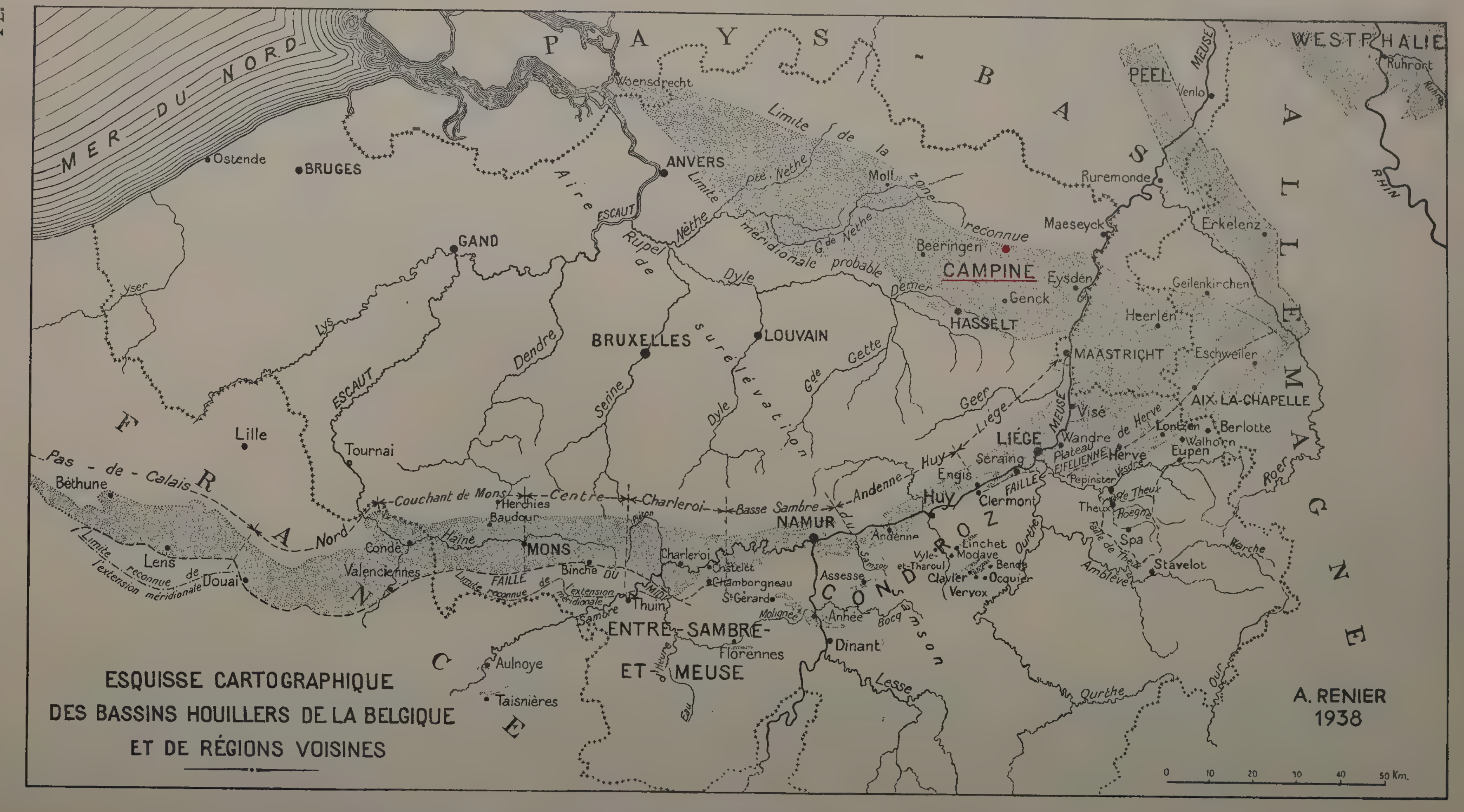
PLATE I. — Map showing the coalfields of Belgium.
The red dot shows the site of boring 121 (Meeuwen-Bullen), in the Campine Coalfield.

PLATE II. — Photographs (Figs. 1-3) showing the leafy shoot of *Ullmannia Bronnii* found in the Meeuwen boring and enlarged parts thereof, and microphotographs (Figs. 4-9) of its epidermis.

*
* *

The sample (n° I. G. 19662) is kept in the collections of the Royal Institute of Natural History of Belgium, 31, Vautier street, Brussels.

PLATE I



The red dot shows the site of boring 121 (Meeuwen-Bullen), in the Campine Coalfield.

PLATE II

EXPLANATION OF FIGURES.

Fig. 1. — Leafy shoot; ×1.

Fig. 2. — The same shoot enlarged; ×2.9.

Fig. 3. — Three leaves on the same shoot still more enlarged in order to show their longitudinal striation; ×7.

Fig. 4. — Portion of the subdenticulate margin of a leaf; ×200.

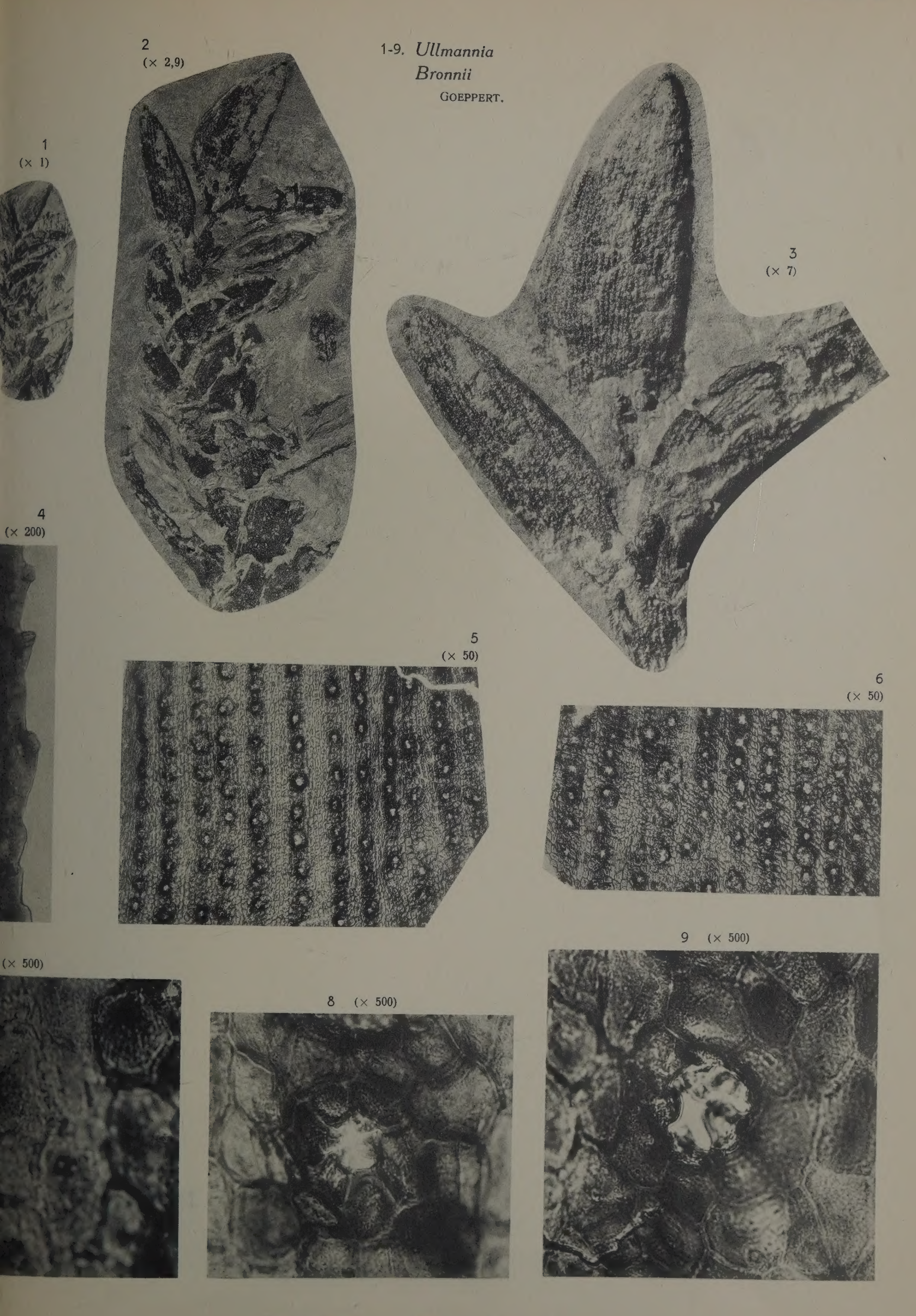
Fig. 5. — Part of the upper epidermis of a leaf with rows of stomata; ×50.

Fig. 6. — Part of the under epidermis of a leaf with rows of stomata; ×50.

Fig. 7. — Papillate epidermal cells : to the right in a stomatal row, to the left between two adjacent stomatal rows; ×200.

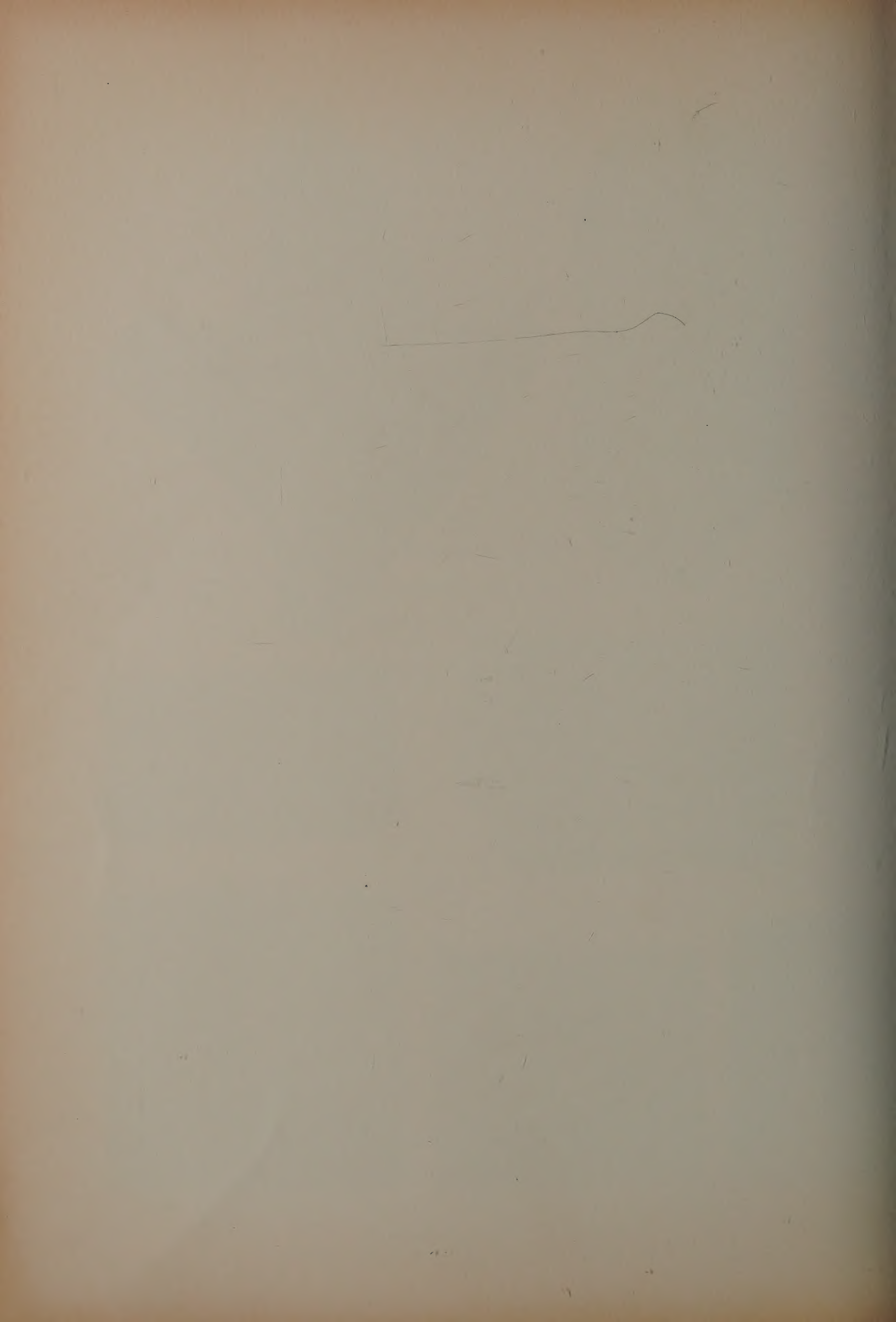
Fig. 8. — Stomatal apparatus with six papillate subsidiary cells; ×500.

Fig. 9. — Stomatal apparatus with eight papillate subsidiary cells; ×500.



R. FLORIN. — Note on *Ullmannia*
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Maison Ern. THILL, Bruxelles.



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